Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: 3

Angry Birds – *The Parabolic Revenge!*

Geometry

Due Date: Tuesday, June 2nd, 2015

Your group name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Red Bird, Yellow Bird, Blue Bird and Black Bird are angry with the pigs! The pigs stole the bird’s eggs. The birds want their eggs back and will stop at nothing to get them back. The flight path of the birds can be modeled with a parabola. Use “x” as the horizontal distance and “y” as the vertical height, both in feet.

|  |  |  |
| --- | --- | --- |
| **Choice A**  Blue & Red Birds | **Choice B**  Blue & Yellow Birds | **Choice C**  Blue & Black Birds |

|  |  |  |  |
| --- | --- | --- | --- |
| **Blue Bird:** | **Red Bird:** | **Yellow Bird:** | **Black Bird:** |

Individual:

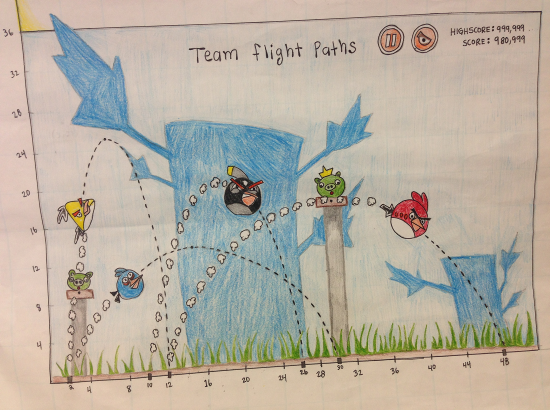
Part 1) **GRAPH -** You need to determine the following information for **each** bird you are assigned. All of this should be clearly shown with a **graph** for **both** birds’ flight paths (on the **same** coordinate plane, clearly labeled).

1. Labeled vertex and roots (solutions / zeros) in coordinate form (x, y)
2. A complete sentence stating the maximum height each bird flew.
3. A complete sentence stating the total distance each bird traveled. Include in your explanation the starting and ending locations.

Part 2) **TABLE -** You need to make a **table** for **each** bird’s flight path:

1. Table of at least 7 values (x & y) starting and ending with the two zeros. All of these points should be included on your graph.
2. Label vertex and zeros on your table. If any cannot be shown on the table, indicate where they would be. Ex: vertex at (4.5, 7) between x=5 and x=6

Group:

Part 3) **GROUP GRAPH**

1. Have one big team graph with ALL these bird’s paths together. ***Your final product should be creative, have an overarching theme, and be thoughtfully planned*** (see example to the right)***.***
2. Determine which bird flew the highest (complete sentence)
3. Determine which bird traveled the longest horizontal distance (complete sentence)
4. Determine which bird, if any, hit the following pigs.   
   **Prove** your answer algebraically or graphically. (Writing “my graph did/didn’t go through that point” does not prove your answer!)

|  |  |
| --- | --- |
| **King Pig located at point (6,24)** | **Moustache Pig located at point (11,35)** |

Individual:

Part 4) **FACTORING:** You need to **solve** each quadratic equation (with all work shown) by **factoring** (box method or alternate method, all work shown)

1. Give **factors** for each quadratic equation. Form: . *Note that one x must be negative.*

Check your work by FOILing your binomials.

1. Give **solutions** to each quadratic equation if y = 0. Form:
2. If you did this correctly, your **solutions**, your **graph**, and your **chart** should all match when .   
   Explain how these solutions relate to the answers in part 1 in your graph and chart.

Part 5) **INTERPRET:** Answer the following questions based off the angry birds you were assigned:

1. If Mr. B built a wall that was 10 feet tall, would your birds be able to fly over the wall? Explain how you know this.
2. Based off of your graph, estimate the horizontal distance and vertical height at which your two birds intersect. If they do not intersect, explain how you can prove this.

Extension Activities:

These may be assigned to you, or you may opt to challenge yourself by doing the extensions.

* **Choice A or B Extension:** What is the smallest *b* value that the Red Bird must have to fly over a 40 foot wall without touching it?
* **Choice C Extension:** What is the minimum initial velocity must the Black Bird have if he must get over a wall that is 12 feet high?